Assignment # 64

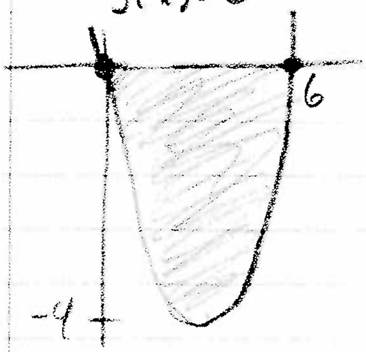
Section 7-1 P.452 Exc 1-4

CPB P.103 Exc 870, 873, 875-878

CPB P.107 Exc 924 & 925

① $f(x) = x^2 - 6x$

$g(x) = 0$



$$\int_0^6 [0 - (x^2 - 6x)]\,dx$$

$$= \int_0^6 [-x^2 + 6x]\,dx$$

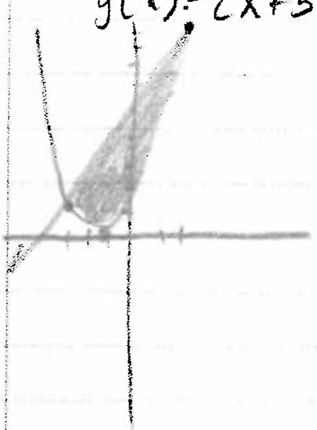
$$= \left. \frac{-x^3}{3} + \frac{6x^2}{2} \right]_0^6$$

$$= \frac{-(6)^3}{3} + 3(6)^2 =$$

$$= -72 + 108 = \boxed{36}$$

② $f(x) = x^2 + 2x + 1$

$g(x) = 2x + 5$



$$\int_{-2}^{2} [(2x+5) - (x^2 + 2x + 1)]\,dx$$

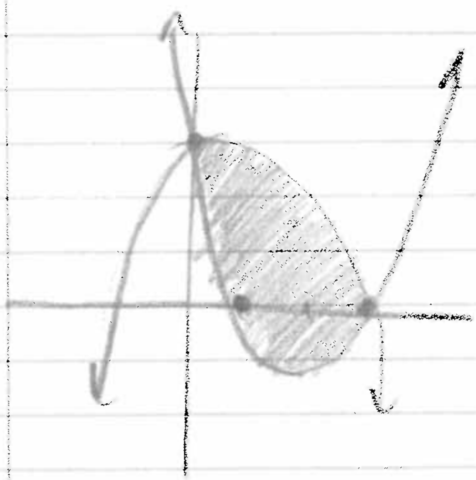
$$= \int_{-2}^{2} (-x^2 + 4)\,dx = \left. \frac{-x^3}{3} + 4x \right]_{-2}^{2}$$

$$\left[\frac{-(2)^3}{3} + 4(2)\right] - \left[\frac{-(-2)^3}{3} + 4(-2)\right]$$

$$\left[-\frac{8}{3} + 8\right] - \left[\frac{8}{3} - 8\right]$$

$$\frac{16}{3} + \frac{16}{3} = \boxed{\frac{32}{3}}$$

(3) $f(x) = x^2 - 4x + 3$
$g(x) = -x^2 + 2x + 3$



$$\int_0^3 [(-x^2+2x+3) - (x^2-4x+3)]\,dx$$

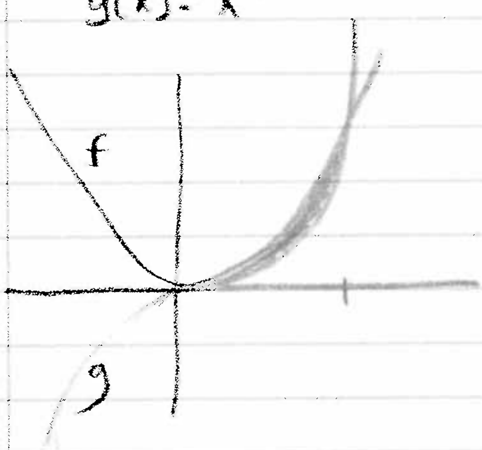
$$= \int_0^3 (-2x^2+6x)\,dx$$

$$= \frac{-2x^3}{3} + \frac{6x^2}{2}\Big]_0^3$$

$$= \frac{-2(3)^3}{3} + 3(3)^2 =$$

$$= -18 + 27 = 9$$

(4) $f(x) = x^2$
$g(x) = x^3$



$$\int_0^1 (x^2 - x^3)\,dx$$

$$= \frac{x^3}{3} - \frac{x^4}{4}\Big]_0^1$$

$$= \frac{1}{3} - \frac{1}{4} = \boxed{\frac{1}{12}}$$

870 $\int \frac{8}{x^{3/5}}\,dx = 8\int x^{-3/5}\,dx = 8\cdot\frac{5}{2}\cdot x^{2/5} = \boxed{20x^{2/5}+c}$

873 $\int \frac{7\sqrt{x}-3x^2-3}{4\sqrt{x}}\,dx = \int\left(\frac{7}{4} - \frac{3}{4}x^{3/2} - \frac{3}{4}x^{-1/2}\right)dx$

$= \frac{7x}{4} - \frac{3}{4}\cdot\frac{2}{6}\cdot x^{5/2} - \frac{3}{4}\cdot 2\cdot x^{1/2} = \boxed{\frac{7}{4}x - \frac{3}{10}x^{5/2} - \frac{3}{2}x^{1/2}+c}$

875 $\int 2^x \ln 2\,dx = \ln 2\int 2^x\,dx = \frac{\ln 2\,(2^x)}{\ln 2} = \boxed{2^x+c}$

876 $\int 5e^x\,dx = 5\int e^x\,dx = \boxed{5e^x+c}$

877 $\int \frac{1}{x^2+1}\,dx = \boxed{\arctan x + c}$

878 $\int \frac{3}{\sqrt{1-x^2}}\,dx = \boxed{3\arcsin x + c}$

924 $y = \int_0^x (t+2)\,dt = \boxed{x+2}$

925 $y = \int_8^x \sqrt[3]{t}\,dt = \boxed{\sqrt[3]{x}}$